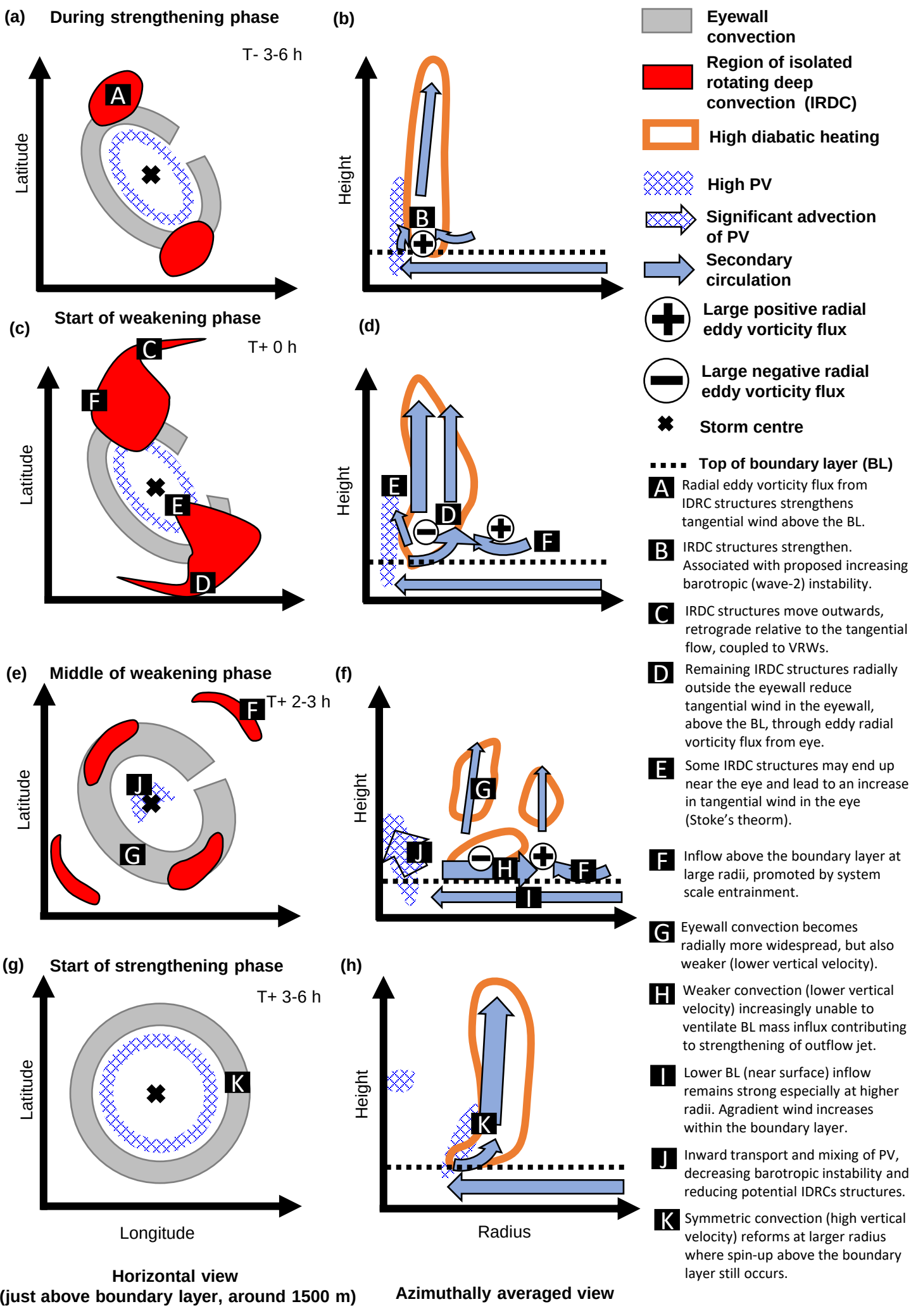
(a) During strengthening phase
T- 3-6 h
Latitude
A
(b)
Height
B
(c) Start of weakening phase
T+ 0 h
C
F
E
D
(d)
E
D
F
(e) Middle of weakening phase
T+ 2-3 h
F
J
G
(f)
G
J
H
F
I
(g) Start of strengthening phase
T+ 3-6 h
K
Longitude
(h)
K
Radius
Horizontal view
(just above boundary layer, around 1500 m)
Azimuthally averaged view
Eyewall convection
Region of isolated rotating deep convection (IRDC)
High diabatic heating
High PV
Significant advection of PV
Secondary circulation
Large positive radial eddy vorticity flux
Large negative radial eddy vorticity flux
Storm centre
Top of boundary layer (BL)
A Radial eddy vorticity flux from IDRC structures strengthens tangential wind above the BL.
B IRDC structures strengthen. Associated with proposed increasing barotropic (wave-2) instability.
C IRDC structures move outwards, retrograde relative to the tangential flow, coupled to VRWs.
D Remaining IRDC structures radially outside the eyewall reduce tangential wind in the eyewall, above the BL, through eddy radial vorticity flux from eye.
E Some IRDC structures may end up near the eye and lead to an increase in tangential wind in the eye (Stoke's theorm).
F Inflow above the boundary layer at large radii, promoted by system scale entrainment.
G Eyewall convection becomes radially more widespread, but also weaker (lower vertical velocity).
H Weaker convection (lower vertical velocity) increasingly unable to ventilate BL mass influx contributing to strengthening of outflow jet.
I Lower BL (near surface) inflow remains strong especially at higher radii. Agradient wind increases within the boundary layer.
J Inward transport and mixing of PV, decreasing barotropic instability and reducing potential IDRCs structures.
K Symmetric convection (high vertical velocity) reforms at larger radius where spin-up above the boundary layer still occurs.